

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The examiners for the Burdett-Coutts Scholarship have reported that no candidate of sufficient merit has presented himself for examination. The Scholarship, therefore, has not been awarded this year.

There will be an election to a Geographical Studentship of the value of £100 at the end of Hilary Term, 1895. Candidates should send in their names to the Reader in Geography, 1 Bradmore Road, Oxford, before Wednesday, February 27, 1895.

The Savilian Professor of Astronomy, Prof. H. H. Turner, will lecture in the Schools on Thursday, November 8, on the subject of the Transit of Mercury on Saturday, November 10.

In a Convocation held on Tuesday, November 6, the degree of Master of Arts, by decree of the House, was conferred on Robert Warington, F.R.S., Sibthorpean Professor of Rural Economy.

CAMBRIDGE.—The Cavendish Laboratory Syndicate have presented a report on the pressing needs of the department of experimental physics. It appears that a large laboratory for elementary classes and an additional lecture room, together with certain accessory rooms, are urgently required. To erect and furnish these on a suitable scale would require some £10,000. As the University is unable to meet any such expense at present, it is proposed to put up part of the building at an expense of £4000, of which half can be provided from the accumulated fees of students working in the laboratory. The Financial Board think that £2000 more can be obtained from the Common University Fund. Mr. Fawcett, the architect, has prepared plans for the work, which are to be seen at the Cavendish Laboratory.

The Sedgwick Memorial Museum Syndicate state that the tenders for the building designed by Mr. T. G. Jackson, A.R.A., have been some £4500 in excess of the estimate based on the architect's calculations. They are reluctantly forced to the conclusion that the University cannot afford to supplement the Memorial Fund to the required extent, and they accordingly ask powers to reconsider the plan, or to substitute a new one for it.

At the annual election to Fellowships at St. John's College, on November 5, Mr. H. C. Pocklington was one of the successful candidates. He was bracketed Fourth Wrangler 1892, was placed in the first division of the first class with Mr. Cowell, the Senior Wrangler, in Part II. of the Tripos of 1893, and this year gained one of the Smith's Prizes, the other falling to Mr. Hough, also a scholar of St. John's. Mr. Pocklington presented a dissertation on the periods of the vibrations of a vortex-ring constituted by fluid circulating round a hollow core, in which the periods of the unsymmetrical vibrations are for the first time determined. The analysis also included a determination of the effect which an electric charge would produce on the vibrations and the stability of a vortex atom in a rotational æther. In a minor investigation, which will appear in the next number of the *Proceedings* of the Cambridge Philosophical Society, the forms assumed by two parallel cylindrical hollow vortices moving steadily through fluid, and the character of the surrounding motion, are investigated in detail.

Mr. S. Sandars has bequeathed to the University £2000 for the endowment of a Reader in "Bibliography, palæography, typography, bookbinding, book-illustration, and the science of books and manuscripts."

As the result of the prolonged discussion on post-graduate study in the University, the Council of the Senate have sanctioned a grace for the appointment of a syndicate to consider (1) the best means of giving further help and encouragement to persons who desire to pursue courses of advanced study or research within the University; (2) what classes of students should be admitted to such courses; and (3) what academic recognition, whether by degrees or otherwise, should be given to such students, and on what conditions.

Mr. Herman, of Trinity College, has been appointed Chairman of Examiners for the Mathematical Tripos, Part I.

Dr. Forsyth, F.R.S., Sir R. S. Ball, F.R.S., R. T. Glazebrook, F.R.S., and Prof. G. B. Mathews, have been appointed Examiners for Part II. of the Mathematical Tripos.

Prof. Ewing, F.R.S., Prof. Osborne Reynolds, F.R.S., and W. N. Shaw, F.R.S., have been appointed Examiners for the Mechanical Sciences Tripos.

DUBLIN.—The medals in Natural Science, given at Moderatorship, have been awarded as follows:—Gold medals to R. A. Rossiter and T. B. Jobson; silver medal to C. W. Orpen. The Professor of Botany's prizes for practical work on the Gymnosperms, to be accompanied by sections and drawings, have been given to T. B. Jobson, for work on the anatomy of the young stem of *Ginkgo biloba* and on the reproductive organs of *Taxus baccata*; and to R. A. Rossiter, for work on the floral development of *Thuja plicata* and *Larix Europæa*.

Lectures on the Experimental and Natural Sciences for Michaelmas Term commenced on November 2. Prof. Reynolds lectures on Inorganic Chemistry, Prof. Fitzgerald on Heat, Prof. Sollas on Mineralogy and Physical Geology. Prof. Mackintosh lectures on Zoology, and gives demonstrations on Comparative Anatomy. Prof. Wright lectures on Algæ and Fungi, and gives a series of demonstrations on the Vascular Cryptogams. The assistant to the Professor of Botany, Mr. H. Dixon, gives a course of Laboratory instruction on vegetable cells and tissues.

The special courses in Natural Science for 1895 are in Geology, the Cambrian Period; in Zoology, the Invertebrate Heart; in Botany, the Natural Orders, Cruciferae and Papilionaceae.

The Anthropological Laboratory has reopened for the session 1894-95. Dr. C. R. Browne will, under the direction of Prof. D. Cunningham, give, on three days in each week during Term, demonstrations on Anthropological Methods. These will be open to all students.

Assisted by a grant from the Royal Irish Academy, Dr. C. R. Browne visited, during the long vacation, the district of North Erris, in the county of Mayo, believed to be one of the most primitive regions in Ireland. The anthropological results of this visit will in due course be laid before the Irish Academy.

The Dublin University Experimental Science Association held its first meeting for its eighteenth session on the 6th inst. Prof. Sollas delivered the opening address, in which he treated of "Geological Time."

FROM a Return made to the Department of Science and Art, and published last week, it appears that the total amount spent on technical education during the year 1892-93, in England, Wales, and Scotland, was £529,718, and that the estimated total amount allocated to technical education for the year 1893-94 was £696,328. Forty-one out of the forty-nine county councils in England are applying the whole of the residue received under the Local Taxation (Customs and Excise) Act to technical education, and eight a part of it to the same purpose. Of the councils of the sixty-one county boroughs, fifty-three are devoting the whole of the residue to technical education, and seven a part of it. The thirteen county councils and the three county boroughs in Wales and Monmouth are not only devoting the whole of the residue to intermediate and technical education, but six of them are also levying a rate, or making grants out of the rates, for the same purpose. In the case of Scotland, twenty-three out of the thirty-three county councils are applying the available funds to technical education, and seven a part. Of the 194 burghs and police burghs, however, 122 are applying the whole to the relief of rates.

THE Technical School Committee of the Birmingham Corporation have appointed Dr. W. E. Sumpner, of the Battersea Polytechnic School, from among seventy-five candidates, as Principal of the new local Technical School. The salary is £500 per annum.

THE extensive buildings that have been lately erected as an addition to the medical school at the Owens College, Manchester, were formally opened by the Duke of Devonshire, the President of the institution, on Tuesday.

SCIENTIFIC SERIALS

American Meteorological Journal, October.—The meteorological services of South America, by A. L. Rotch. In the Argentine Republic there are now five stations of the first order, forty of the second order, and one hundred rain stations. The first of the *Annales* was published in 1878, and dealt with the climate of Buenos Ayres from observations since 1801. In Uruguay there is one observatory of the first order, at Villa Colon, near Montevideo, and in 1890 a Meteorological Society was established, and publishes a

monthly review. In Brazil, observations were made at Rio de Janeiro, since 1825, but no record of them is to be found until 1844; from this time summaries have been regularly published. A Central Meteorological Department was established in 1888 in connection with the bureau of the Navy, but the climatological service has not yet been organised.—The forecasting of ocean storms, &c., by W. Allingham. This paper was prepared for the International Meteorological Congress held at Chicago in August last. It deals more particularly with the storms of the North Atlantic, and the author shows that at present any attempt to forecast them from America is not very successful. Nevertheless, the Meteorological Office of Paris continues to receive and publish daily reports from the United States and Canada, as well as from steamers arriving at American ports from the Atlantic.—Sun-spots and Auroras, by Prof. H. A. Hazen. The author has laid down curves of all the sun-spots measured on the Greenwich and India photographs from 1881 to 1888, and also the auroral numbers recorded in the United States, and shows that auroras and sun-spots are not concomitant or coincident phenomena. For the purpose of inquiring into the annual range, the auroras and sun-spots for twenty-three years have been summed for months. There is a remarkable correspondence in these results; both phenomena show a maximum in April, and the second maximum occurs in September for auroras, and in October for sun-spots. Prof. Hazen considers that the investigation of sun-spots and auroras is the most promising line that can be taken in a study of the possible effects from some cosmical force upon our atmosphere.

Bulletin of the American Mathematical Society, second series, vol. i. No. 1 (October 1894).—This is a continuation of the *Bulletin* of the New York Society. The title of the Society having been changed, as previously announced, of necessity the title of the *Bulletin* is also changed. An article on the "Summer meeting of the American Mathematical Society" gives an account of the doings, and abstracts of the papers read, at the August meeting in Brooklyn, N.Y., of the American Association for the Advancement of Science. The co-operation of the two Associations resulted in a successful gathering for the younger body.—Other articles in this number are on the connection between binary quartics and elliptic functions, by Prof. E. Study. This is an abstract of a paper which will appear in the *American Journal of Mathematics*. It shows how a certain group of rational and irrational co-variants of a binary quartic can be expressed as one-valued functions of one or two parameters, thus filling up a number of lacunæ contained in former presentations of the subject.—Reduction of the resultant of a binary quadric and n -ic by virtue of its semi-combinant property, by Prof. H. S. White. The author discusses the partial problem solved by Clebsch, viz. to write in symbolic form the resultant of a binary quadric and a binary quantic of arbitrary order n . The method employed is novel, and illustrates the utility of the theory of conjugate forms.—Next a list of astronomical papers read at the American Association meeting (see *supra*), is given, and short abstracts supplied. Notes and new publications complete this number.

American Journal of Mathematics, vol. xvi. No. 4 (Baltimore, October 1894).—"Sur la transformation des courbes algébriques," by E. Goursat (pp. 291–298), discusses two generalisations of a theorem demonstrated by Lüroth (*Math. Ann.* ix. p. 163). The rest of the number (pp. 299–396) is taken up by a masterly memoir on isotropic elastic solids of nearly spherical form, by C. Chree. It is preceded by a full table of contents, and has 320 equations. The author remarks that the investigation of a solution of the elastic solid equations for the equilibrium or motion of homogeneous isotropic material enclosed by the simplest of all surfaces, the spherical, presents no small difficulty. For even a slight departure from the spherical form the increase of difficulty is so considerable that, so far as I know, the only problem of the class successfully treated hitherto is that of a nearly spherical solid exposed to gravitational force, but free of all surface force. In the case considered by Mr. Chree, surface forces appear as well as bodily forces, so that the problem is much more general than that previously treated. His method is novel, and the memoir closes with some speculations as to the action of the sun on the earth.

Bulletin de la l'Académie Royale de Belgique, No. 8.—Note on the subject of a recent communication from M. Ch. Lagrange, by M. F. Folie. The author claims to have been

the first to announce that the theoretical period of initial nutation would be found too short owing to the internal fluidity of the globe, and that the best method for observing this nutation would be that of observations at intervals of twelve hours. He also stated that the variations of latitude would be equal and of opposite sign on two opposite meridians in the same hemisphere, which was borne out by observations in Europe and Honolulu. His hypothesis explaining the annual variations is capable of explaining and estimating the systematic differences between the catalogues of Greenwich and the Cape, given by Downing, and by the diurnal nutation, the differences between Paris, Pulkowa, and Washington, and between Melbourne and the Cape.—On the origin of the microtism and the undulations of the systolic plateau of arterial pulsation, by Victor Willem. This work was undertaken in order to decide whether any of the pulsations shown by the sphygmograph and the recorders of arterial pressure have a peripheral origin, or whether they all start from the heart and its neighbourhood. Experiments upon the carotid and crural arteries of dogs show that the latter alternative is true. The author further studied the influence of various injections upon the pulsation.

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, October 17.—Henry John Elwes, President, in the chair.—Dr. H. G. Breyer, of Prætoria, Transvaal, South Africa, was elected a Fellow of the Society. Mr. G. C. Champion read a letter, dated August 15 last, from Mr. J. Y. Johnson, of Funchal, Madeira, on the subject of a recent visitation of locusts to the island, and exhibited specimens. Mr. Johnson mentioned that Darwin, in his "Origin of Species," recorded that in November 1844, dense swarms of locusts visited Madeira. He said that since then, until August last, these insects had not visited the island. Mr. Champion remarked that the species was *Decticus albifrons*, Fabr., not a true migratory locust. Mr. Champion also exhibited specimens of *Anthaxia nitidula*, *Velleius dilatatus* and *Athous rhombeus*, taken by himself in the New Forest during the past summer.—Mr. H. Goss read a letter received from Captain Montgomery, J.P., of Mid Ilovo, Natal, reporting vast flights of locusts there, extending over three miles in length, on August 31 last, and exhibited a specimen of the locust, a species of *Acridium*. Captain Montgomery stated that, as a rule, his district, like most of Natal, was free from the pest, but that an exceptional invasion had occurred in 1850.—Mr. J. W. Tutt exhibited four typical specimens of *Emydia cribrum* from the New Forest, and, for comparison, four specimens of the variety, *candida*, of the same species, taken at an elevation of 4000 feet, near Courmayeur, on the Italian side of Mont Blanc. He stated that he had also met with this form in the Cogne Valley, at an elevation of from 6000 to 8000 feet.—Mr. R. Adkin exhibited a specimen of *Erebia athiops*, in which the left fore wing was much bleached, taken in August last, near Carnforth. Mr. Adkin also exhibited a series of *Acronycta rumicis* from Co. Cork, Ireland, including light and black forms, with examples from the Scilly Isles, Isle of Man, and North of Scotland for comparison.—Mr. Elwes exhibited a series of *Chionobas alberta* ♂ & ♀, *Chionobas uhleri*, var. *varuna*, and *Erebia discoidalis*, from Calgary, Alberta, N.W. Canada, which had been collected in May last, by Mr. Woolley-Dod. He said that the validity of *C. alberta*, which had been questioned by Mr. W. H. Edwards, was fully established by these specimens.—Prof. E. B. Poulton, F.R.S., gave an account of the changes which he had recently made at Oxford in the arrangement of the Hope Collections in the Department of Zoology, and as to the rooms now available for students working at these collections.—Mr. G. T. Bethune-Baker communicated a paper, entitled "Descriptions of the Pyralidæ, Crambidæ, and Phycidæ, collected by the late T. Vernon-Wollaston in Madeira."

PARIS.

Academy of Sciences, October 29.—M. Lœwy in the chair.—Experimental verifications of the theory of weirs, with either adherent or partly submerged water-sheet, with regard to the pressures, by M. J. Boussinesq.—On the existence in plants of principles capable of condensation with production of carbonic acid, by MM. Berthelot and G. André. Plant-leaves were